

Huppenthal

Reference 4

DRAFT

6/12/96

TO: Jon Huppenthal
FROM: Seymour Cray
RE: Employment in Newcorp

I am offering you employment with my new company effective July 1, 1996 or a start date at your convenience, if you would prefer to take some time off. I am personally committing to you a guarantee of two years of employment at a starting salary of \$██████ per year. Because the company is just beginning (I expect incorporation by August 1, 1996), we would provide an additional supplement of \$██████ per month until a reasonable fringe benefit package becomes available for all employees of the new company.

Your duties and responsibilities would center around your role as the Head of Electrical and Mechanical Engineering in the design and development of our new computer product line. In that capacity you would report to Terry Willkom and be expected to work closely with myself and the software group as we develop the technical parameters for a low cost supercomputer using commodity parts and current technology.

Newcray Computer Business Plan

•• The New Company

Newcray Computer Corporation ("Newcray") is a new privately owned company being formed to build and support high performance scientific computer systems. This company is an outgrowth of Cray Computer Corporation which is a public company currently in bankruptcy. Newcray plans to rehire a significant portion of the management and technical staff of Cray Computer to begin operation of the new company. Basic changes will be made in the type of product manufactured as described below. The market, however, is the same market addressed by the public company.

•• Current Status of Cray Computer

Cray Computer is currently being reorganized under Chapter 11 of the Bankruptcy Code. The company voluntarily filed for bankruptcy protection in March of 1995. Operations of the company were terminated at that time and all but a few management employees have left the company and are currently employed elsewhere. The company has operated as a debtor in possession from that date to the current date. No trustee or examiner has been appointed by the court. The company has filed a plan of reorganization which essentially liquidates all of the assets. The company believes the creditors will be paid nearly all of their claims but there will be no funds remaining to be distributed to shareholders.

•• History of Public Company

Cray Computer was incorporated in 1989 as a spin off of Cray Research, Inc. Cray Research has been in the business of building large scientific computers since 1972. At the time of the spin off, Cray Research had two product lines which were competing in the same market. The management decided to separate the product lines and distribute stock to shareholders for the two separate ventures. Seymour Cray, the founder of Cray Research, then left the parent company and began Cray Computer with the product line called Cray-3. This was the product line with the most advanced technology and with the greatest risk.

•• Reason for Public Company Failure

Cray Computer between 1989 and 1995 produced the Cray-3 and Cray-4 computer systems. These machines were technically successful but were not economically competitive in the market place. Technical development delays caused the Cray-3 to be two years late to the market. The Cray-4, an evolutionary improvement to the Cray-3, was available at a time when the market for large scientific computers was in confusion because of new product introductions and numerous company failures. No potential customer for the Cray-4 computer would risk the large capital investment in this uncertain environment.

•• *Changes in Scientific Marketplace*

During the period 1990 to 1995 the market for large scientific computers was traumatized by the introduction of very capable work stations and Massively Parallel Processor (MPP) configurations. The products of Cray Research and Cray Computer typically sold for \$10,000,000. Work stations appeared in this time frame which were perhaps 10% as capable but sold for \$200,000. Some traditional "Cray" customers chose to buy many smaller work stations rather than single large systems.

A second confusion factor in this time frame was the introduction of MPP systems. These systems used mass produced microprocessors in large numbers rather than the custom vector processors in Cray Research or Cray Computer systems. These new MPP systems had some serious programming problems to coordinate many small processors to do the work of one fast processor. The U.S. government perceived that these MPP systems would be the machines of the future. The government funded many MPP research facilities which would otherwise not have been cost effective. This distorted the market place for several years.

In 1994 the government reversed course and withdrew support for MPP systems as a part of general government cost reduction. This resulted in a wave of MPP company failures and chaos in the facilities that had participated in the government programs. In this environment all large computer facility managers were reluctant to buy any large computer product.

•• *Scientific Marketplace Today*

Today there is a backlash from the over optimism of the MPP systems. Some progress was made in the programming problems of MPP systems but the effort to complete this work was much greater than anticipated. Much damage was done to the scientific computer companies in the United States. Cray Computer went into bankruptcy. Cray Research became financially too weak to survive alone and was acquired by Silicon Graphics. Convex Computer was acquired by Hewlett Packard for the same reason. Almost all of the MPP companies have gone out of business.

Today the best selling large scientific computers are Japanese. Fujitsu and Nippon Electric Company (NEC) are dominating the vector machine market world wide. There is divided opinion as to whether MPP systems will come of age without the U.S. government support. The strong showing of the U.S. computer industry is in the work station market. The question is how to configure these work stations to best solve the large scientific problems. This is the area addressed by the emerging private Newcray Computer Corporation.

•• *Shared Memory vs Distributed*

There are two major approaches in using microprocessor work stations in "clusters" to solve large scientific problems. In the distributed approach each microprocessor (node) has its own memory. Communication between microprocessor nodes is generally between neighbors in two or three dimensions. There is a "grid" of processor nodes. This is the cheapest approach but has programming problems if the application requires a lot of memory access over the entire memory structure.

The second approach has all of the processors sharing a common memory. This requires cross bar switches (like a telephone system) to connect any processor to any memory bank. There is additional cost in the cross bar switches. There is a programming advantage in that any processor can address the entire memory of the cluster of work stations. This has not been practical for very large systems to date because microprocessors have had only 32 bits of address. This is changing because 64 bit processors are becoming available in 1997. This second approach is the one to be used by Newcray Computer Corporation.

•• *The New Company Product*

The initial Newcray product (NC7) is narrowly focused on the large scientific market using new generation work stations with a common memory. It will use a microprocessor which is the next generation product from Intel Corp. This microprocessor will follow the "Pentium Pro" which is the current volume product for personal computers and work stations. The microprocessor to be used in the NC7 has a 64 bit structure and has the computing capability of the Cray-4 custom processor at a small fraction of the cost. This same processor will be used in personal computers and small work stations in the 1998 to 2000 time frame.

The NC7 memory will use the next generation of mass produced synchronous dynamic random access memory parts (SDRAM). These parts are not used today in personal computers or work stations but all major suppliers of these products are planning the conversion to SDRAM parts in the next few years. These parts are currently available in 16 megabit chips from a number of memory suppliers. This size part will be used in early NC7 systems. A design upgrade to 64 megabit parts will occur in later versions of the system.

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